Appendix A

DP/4 MIDI SysEx Implementation Specification - version 1.02

1 Introduction and Overview

This document describes the MIDI System Exclusive (SysEx) communication protocol used when the DP/4 is communicating with an external computer or device (EXT). The protocol is designed to support the implementation of data storage, management and editing programs running on EXT, and so this information is especially relevant to designers and programmers of such programs. The commands described here allow editor/librarian programs to acquire, modify and replace DP/4 preset and system control data.

1.1 Universal System Exclusive Device Inquiry Message

The DP/4 supports the MIDI Device Inquiry message which allows instruments and computers to ascertain the identity of the unit(s) to which they are connected via MIDI. The DP/4 responds to the following Identity Request message by sending an Identity Reply message. The DP/4 will respond to the inquiry if the channel information in the message contains either the Device ID of the DP/4 or the All Channel Broadcast code (7Fh), but the message should not contain both.

11110000	F0	System Exclusive status byte
01111110	7E	Non Real Time message code
0000nnnn	0n	nnnn = Device ID number
– or –		
01111111	7F	All Channel Broadcast code
00000110	06	General Information message code
00000001	01	Identity Request message code
11110111	F7	End of System Exclusive

1.2 System Exclusive Device Identity Reply Message

The following Identity Reply message contains information about the DP/4, and is transmitted in response to an Identity Request.

11110000	F0	System Exclusive status byte
01111110	7E	Non Real Time message code
0000nnnn	0n	Base MIDI channel number
00000110	06	General Information message code
00000010	02	Identity Reply message code
00001111	0F	ENSONIQ manufacturer's code
01000000	**40**	Signal Processor Product Family ID code - LSByte
00000000	00	Signal Processor Product Family ID code - MSByte
00000000	**00**	DP/4 Family Member (Model ID) code LSByte
00000000	00	DP/4 Family Member (Model ID) code MSByte
00000000	00	Software revision information:
00000000	00	— (first two bytes not used by DP/4 - always zero)
0vvvvvvv	vv	— Major Version Number (integer portion)
0vvvvvvv	vv	— Minor Version Number (decimal fraction portion)
11110111	F7	End of System Exclusive

2 MIDI System Exclusive Packets

A System Exclusive message can be viewed as a packet of information which appears in the form of a MIDI data stream. Each packet can be divided into three sections or pieces. The first and last packet pieces form the frame for the message. The Message contains the commands described in section 3. Every Message must be preceded with a SysEx head and followed with a SysEx tail. A complete packet looks like this:

SysEx Head.....Message .....SysEx Tail

2.1 MIDI System Exclusive Packet Head

This is the common MIDI system exclusive header which must be used on all system exclusive messages sent to and from the DP/4. These five bytes are always sent preceding the message portion of the packet. The DP/4 Model ID Code in this header is the common for all compatible members of the family to allow exchange of information. All messages which are not recognized by the DP/4 will be ignored. In all subsequent message descriptions, "*[header]*" represents this five byte structure.

11110000	F0	System Exclusive status byte
00001111	0F	ENSONIQ Code
01000000	40	Signal Processor Family ID Code
00000000	00	DP/4 Model ID Code
0000dddd	0d	dddd = Device ID (Base MIDI channel) number

The 5-byte SysEx header is always followed by the Message type code byte:

0mmmmmmm	0m	mmmmmmm = Message Type code (see section 3)

2.2 MIDI System Exclusive Packet Tail

For every head there must be a tail. The tail follows the message portion, and is the last byte of every complete SysEx packet.

11110111	F7	End of System Exclusive

2.3 Message Format

The Message Type code in the packet head defines the message format. The specific format depends on the message type. There may be additional bytes which provide more information about the message, and in some cases there may also be a bulk data segment. Within these bulk data segments, 8 bit data bytes must be transmitted and received using the 7 bit data format of MIDI, where the MSB of these data bytes must always be a zero, so each of the 8 bit data bytes is converted to two 4 bit nybbles for transmission. These nybbles each sent as bytes whose upper four bits are all zero. This is a description of the format of all nybblized data bytes within the packet frame as they are transmitted or received via MIDI. The details of each message are given in section 3.

0000HHHH	H = Hi 4 bits of data byte - transmitted first
0000LLLL	L = Lo 4 bits of data byte

This represents how the 8 bit byte HHHHLLLL would be transmitted.

2.4 Receiver Errors

If a message received by the DP/4 is not understood, or is incomplete, then an informative error message will be displayed and an error message will be sent as described in section 3.2. Errors typically occur when the MIDI In cable is accidentally disconnected during a long dump message (such as an All Presets Dump message).

3 Message Types

This section describes the various messages to be used between EXT and DP/4. The message type code corresponds to the last byte of the system exclusive packet head described in section 2.1.

3.1 Command Messages (Message Type = 01)

Command messages are used to transmit simulated front panel user actions *to* the DP/4, but they are not transmitted *from* the DP/4. These command messages employ a generalized variable size message format in which the command code and the command-specific data bytes are transmitted using the nybblized message format described in section 2.3. Remember, the message type code is part of the header and is sent as a byte, but the command code is considered part of the data segment and must be sent as two nybbles. Successful transactions are followed by an error message indicating that no error occurred (ACKnowledge). This ACK also indicates that the system is ready for the next transaction.

3.1.1 Parameter Change Command

This message allows any effect parameter to be edited under remote control. When this message is received, the system will automatically be put into Edit (or System) mode and the specified unit will become active. The unit number in the message (specified using the following codes) indicates which logical group contains the parameter to be edited.

Unit	*Number*	*Unit*	*Number*
A	0	D	3
B	1	Config	4
C	2	System	5

The parameter number must be legal within the specified group, with unit parameters based on effect type and config parameters based on Input Config. The new parameter value is always transmitted as a 16 bit word. If the parameter only uses an 8 bit value, then the MSByte should be transmitted as zero. Illegal values will not change the value in the system, and an error message will be returned to indicate the problem.

Parameter Change Command

Message code: 01 (Command message)
Command code: 01
Message size: 17 MIDI bytes

[header]	DP/4 SysEx Header
00000001	Command Message code
*Note: the following 5 bytes must **each** be transmitted as nybbles!*	
00000001	Parameter Change command code
00000uuu	uuu = unit number (0..4)
0ppppppp	ppppppp = parameter number (0..127)
mmmmmmmm	mmmmmmmm = parameter value MSByte
11111111	11111111 = parameter value LSByte
11110111	End of Exclusive status byte

Example (in hexadecimal notation, assuming MIDI Device ID = 01 transmitted as 00):

Header	*ID*	*Msg*	*Cmd*	*Unit*	*Param*	*— Value —*	*EOX*	Unit C; Param 03
F0 0F 40 00 00		01	00 01	00 02	00 03	00 00 07 0F	F7	Value = 127 (7Fh)

3.1.2 Virtual Button Command

EXT can simulate button presses from the front panel of the DP/4 by sending this command. The rear panel foot switches can also be simulated using this command. Sending the listed logical button numbers will simulate a single button being held down. Button up commands require the button logical numbers as listed below *with an offset of 128 (80h) added.* The button number follows the command code byte in the message. Remember to send a button up command for every button down command that is sent. Note: a brief delay (100 msecs) between button commands, or at least pairs of button commands, is recommended to allow time for the DP/4 to do any required internal processing and update the display..

Logical Number	*Front Panel Button Name*	*Logical Number*	*Front Panel Button Name*
0	A (Unit A)	7	System
1	B (Unit B)	8	Left arrow
2	C (Unit C)	9	Right arrow
3	D (Unit D)	10	Cancel
4	Config	11	Write
5	Select	12	Foot switch 1
6	Edit	13	Foot switch 2

Virtual Button Command

Message code: 01 (Command message)
Command code: 02
Message size: 11 MIDI bytes

[header] DP/4 SysEx Header
`00000001` Command message code
Note: the following 2 bytes must ***both*** *be transmitted as nybbles!*
`00000010` Virtual Button command code
`s000nnnn` s = button state (0 = down; 1 = up); nnnn = button logical number (0..13)
`11110111` End of Exclusive status byte

Example (in hexadecimal notation, assuming MIDI Device ID = 01 transmitted as 00):

Header	*ID*	*Msg*	*Cmd*	*Button*	*EOX*	
F0 0F 40 00	00	01	00 02	00 01	F7	B (Unit B) button down
F0 0F 40 00	00	01	00 02	08 01	F7	B (Unit B) button up

3.1.2 Virtual Knob Command

This command is used to simulate the rotation of the data entry knob on the front panel of the DP/4. Each command message received will effectively turn the knob up to 63 increments (clockwise) or decrements (counter-clockwise), as specified by the number and direction information in the message. If the specified number of "clicks" causes the knob to wrap (change direction) internally, an error message is returned.

Virtual Knob Command

Message code: 01 (Command message)
Command code: 03
Message size: 11 MIDI bytes

[header] DP/4 SysEx Header
`00000011` Command message code
Note: the following 2 bytes must ***both*** *be transmitted as nybbles!*
`00000011` Virtual Knob command code
`d0nnnnnn` d = direction (1 = clockwise/increment; 0 = counter-clockwise/decrement); nnnnnn = number of increments or decrements (0..63)
`11110111` End of Exclusive status byte

3.2 Error Messages (Message Type = 02)

Error messages are transmitted by the DP/4 when an error occurs while processing any of the messages described in section 3. DP/4 error messages contain a single byte of data. This byte indicates the error status of the last transaction. After a command message or a dump message is received, an error message is sent when the DP/4 has completed the processing of the received message or if an error occurs during the reception of the message. This feature is intended to aid in the implementation of "handshaking" schemes with external devices. *Please note that error messages are not sent in response to a valid dump request; instead the DP/4 transmits the requested dump.* The following table lists the error codes that may be sent by the DP/4:

Error Code	*Error Description*
0	Acknowledge (ACK) — No error.
1	Receiver time out (> 1 second since last byte of message was received).
2	EOX (End of Exclusive F7h) was received when command code data was expected.
3	DP/4 was still processing previous command.
4	EOX received when other data was expected.
5	The byte received after the data block was not EOX.
6	Command message contained an invalid or illegal argument.
7	Parameter value in command was illegal.
8	Button number in command was illegal.
9	Knob value in command was illegal.
10	The preset received by the DP/4 was not automatically loaded because its type was incompatible with the current configuration.

Note that the DP/4 only *transmits* these error messages. If they are received by the DP/4, they will be ignored.

Error Message

Message code: 02
Message size: 8 MIDI bytes

[header]	DP/4 SysEx Header
`00000010`	Error message code
`0eeeeeee`	`eeeeeee` = error code (see above listing)
`11110111`	End of Exclusive status byte

3.3 Request Messages

The DP/4 will respond to the following dump request messages by transmitting the requested bulk dump. There is no error message sent if the request is legal; the bulk dump serves as the confirmation response. Note: The DP/4 receives but does not transmit the following Dump Request messages.

3.3.1 Single Preset Dump Request (Message Type = 16)

The DP/4 will dump the specified internal RAM preset using the bulk dump message described in section 3.4 when it receives this message.

Single Preset Request Message

Message code: 16
Message size: 9 MIDI bytes

[header]	DP/4 SysEx Header
00010000	Single preset request message code
000000tt	tt = preset type (0..3)
0nnnnnnn	nnnnnnn = preset number (0..99)
11110111	End of Exclusive status byte

3.3.2 Preset Bank Dump Request (Message Type = 17)

The DP/4 will dump the specified internal RAM preset bank using the bulk dump message described in section 3.4 when it receives this message.

Note that it is possible to request preset banks from ROM by setting the RAM/ROM select code bits in the byte containing the preset bank type code. This enables external devices to get a dump of the factory ROM presets, which is not possible any other way. The ROM bank dump will have the same format as the normal preset bank dumps from RAM.

Select Code	*Select Function*
00	RAM Preset banks (normal setting)
01	ROM Preset banks
10	Alternate ROM banks ("hidden" in ROM and used to initialize RAM banks)

Preset Bank Request Message

Message code: 17
Message size: 8 MIDI bytes

[header]	DP/4 SysEx Header
00010001	Preset bank request message code
00ss00tt	ss = RAM/ROM select code (0..2); tt = preset bank type (0..3)
11110111	End of Exclusive status byte

3.3.3 All Presets Dump Request (Message Type = 18)

The DP/4 will dump all RAM preset memory using the bulk dump message described in section 3.4 when it receives this message.

All Preset Banks Request Message

Message code:	18
Message size:	7 MIDI bytes
[header]	DP/4 SysEx Header
00010010	All preset banks request message code
11110111	End of Exclusive status byte

3.3.4 System Parameters Dump Request (Message Type = 19)

The DP/4 will dump all of the system global parameters using the bulk dump message described in section 3.4 when it receives this message.

System Parameters Request Message

Message code:	19
Message size:	7 MIDI bytes
[header]	DP/4 SysEx Header
00010011	System parameters request message code
11110111	End of Exclusive status byte

3.3.5 All Presets with System Parameters Dump Request (Message Type = 20)

The DP/4 will dump all internal RAM preset memory and the system global parameters using the bulk dump message described in section 3.4 when it receives this message.

All Preset Banks And System Parameters Request Message

Message code:	20
Message size:	7 MIDI bytes
[header]	DP/4 SysEx Header
00010100	All preset banks and system parameters request message code
11110111	End of Exclusive status byte

3.3.6 Edit Buffer Request Message (Message Type = 21)

The DP/4 will dump the current contents of the "edit buffer" using the bulk dump message described in section 3.4 when it receives this message. This system context information is useful for external editors needing to obtain the current status of all units.

Edit Buffer Request Message

Message code:	21
Message size:	7 MIDI bytes
[header]	DP/4 SysEx Header
00010101	Edit buffer request message code
11110111	End of Exclusive status byte

3.4 Dump Messages

Bulk data dump messages are transmitted using the message format described in section 2.3. The message type byte, which is part of the system exclusive header, is given in decimal along with the name of the dump message. The actual data structures for presets and the system parameters are described in Section 4. The MIDI data byte lengths are listed in decimal for each message type.

3.4.1 Single Preset Dump (Message Type = 32)

This dump contains all data from a single preset (refer to section 4).
When this message is transmitted from the DP/4, it contains the data from the specified RAM preset. When this message is received by the DP/4, the new preset will be saved into the specified preset location in the internal RAM. *Remember that the specified destination preset is over-written by the incoming data and its previous contents are lost.* If this message is used to send a preset to a generic MIDI SysEx recorder, the destination preset number is embedded in the message. When the dump is reloaded into the DP/4, that same location will be replaced by the incoming preset data.

Note that the preset will be automatically "selected" loaded after it is received by the DP/4 if the preset type is compatible with the current configuration, based on the current active unit. The following table shows, for each preset type, which units may be active and which configuration is required if the preset is to be automatically selected.

Preset Type	*Code*	*Active Unit*	*Configuration*	*Units Loaded*
Config	3	Config	<any>	A, B, C, D & Config
4 Unit	2	A, B, C, D	One Source	A, B, C, D
2 Unit	1	AB, CD	Two Source	AB or CD
2 Unit	1	CD	Three Source	CD
1 Unit	0	A, B, C, D	Four Source	A or B or C or D
1 Unit	0	A, B	Three Source	A or B

The DP/4 returns an error message if the current configuration does not support "selecting" the received preset's type into the active unit. In all cases, the DP/4 saves the received preset data into the designated RAM preset location and displays a reception complete confirmation message.

Preset Type	*Data segment sizes*		*Total Message size*
	Bytes	*Nybbles*	*MIDI Bytes*
One Unit Preset	51	102	111
Two Unit Preset	87	174	183
Four Unit Preset	158	316	325
Config Preset	163	326	335

Single Preset Dump Message

Message code:	32
Message size:	9 MIDI bytes plus Data segment size (see above listing)
[header]	DP/4 SysEx Header
`00100000`	Single preset dump message code
`000000tt`	`tt` = preset type code (0..3)
`00nnnnnn`	nnnnnn = destination RAM preset number (0..49)
...	
[data]	Data segment (nybblized)
...	
`11110111`	End of Exclusive status byte

3.4.2 Preset Bank Dump (Message Type = 33)

Each Preset Bank Dump message contains the data comprising the 50 User Presets. The actual size of the dump is dependent on the preset bank type. These dumps are only received into the RAM preset banks of the DP/4, but may be sent from RAM or ROM depending on the request message.

Preset Bank Type	*Data segment sizes*		*Total Message size*
	Bytes	*Nybbles*	*MIDI Bytes*
One Unit Preset Bank	2550	5100	5108
Two Unit Preset Bank	4350	8700	8708
Four Unit Preset Bank	7900	15800	15808
Config Preset Bank	8150	16300	16308

Preset Bank Dump Message

Message code:	33
Message size:	8 MIDI bytes plus Data segment size (see above listing)
[header]	DP/4 SysEx Header
`00100001`	Preset bank dump message code
`000000tt`	`tt` = preset type (0..3)
...	
[data]	Data segment (nybblized) — 50 presets
...	
`11110111`	End of Exclusive status byte

3.4.3 All Presets Dump (Message Type = 34)

The All Preset Banks Dump message contains four concatenated 50 preset dumps, in the following order: One Unit Presets Bank, Two Unit Presets Bank, Four Unit Presets Bank and finally the Config Presets Bank. The size of the data segment is the sum of the four individual bank dump sizes.

Dump Component	*Data segment sizes*		*Total Message size*
	Bytes	*Nybbles*	*MIDI Bytes*
One Unit Preset Bank	2550	5100	
Two Unit Preset Bank	4350	8700	
Four Unit Preset Bank	7900	15800	
Config Preset Bank	8150	16300	
Total:	22950	45900	45907

All Preset Banks Dump Message

Message code:	34
Message size:	7 MIDI bytes plus Data segment size (see above listing)
[header]	DP/4 SysEx Header
`00100010`	All preset banks dump message code
...	
[data]	Data segment (nybblized) — Four concatenated 50 preset banks
...	
`11110111`	End of Exclusive status byte

3.4.4 System Parameters Dump (Message Type = 35)

Dump Type	*Data segment sizes* *Bytes*	*Nybbles*	*Total Message size* *MIDI Bytes*
System Parameters	1312	2624	2631

System Parameters Dump Message

Message code: 35
Message size: 7 plus data segment size = 2631 MIDI bytes

[header]	DP/4 SysEx Header
00100011	System parameters dump message code
...	
[data]	Data segment (nybblized) — 1312 bytes of system parameters
...	
11110111	End of Exclusive status byte

3.4.5 All Presets with System Parameters Dump (Message Type = 36)

The All Preset Banks with System Parameters Dump message comprises the data segment from the All Preset Banks Dump concatenated with the System Parameters. The data is sent in the following order: One Unit Presets Bank, Two Unit Presets Bank, Four Unit Presets Bank, Config Presets Bank, and finally the System Parameters. The size of the data segment is the sum of the four individual bank dump sizes plus the system parameters data segment size. Refer to the individual message descriptions for more information of the structure of the data.

Dump Component	*Data segment sizes* *Bytes*	*Nybbles*	*Total Message size* *MIDI Bytes*
One Unit Preset Bank	2550	5100	
Two Unit Preset Bank	4350	8700	
Four Unit Preset Bank	7900	15800	
Config Preset Bank	8150	16300	
System Parameters Bank	1312	2624	
Total:	24262	48524	48531

All Preset Banks with System Parameters Dump Message

Message code: 36
Message size: 7 plus data segment size = 48531 MIDI bytes

[header]	DP/4 SysEx Header
00100100	All preset banks with system parameters request message code
...	
[data]	Data segment (nybblized) — Four preset banks concatenated with system parameters
....	
11110111	End of Exclusive status byte

3.4.6 Edit Buffer Dump (Message Type = 37)

This dump sends the current contents of the "edit buffer" from the DP/4 in the form of a Config preset (see section 4.2). This dump is only transmitted by the DP/4 and will not be recognized if received. The dump is intended as a means by which an external device can obtain a current status update for all units.

Dump Type	*Data segment sizes*		*Total Message size*
	Bytes	*Nybbles*	*MIDI Bytes*
Edit Buffer Parameters	163	326	334

The value of the byte which follows the message type code indicates the current Active Unit number according to the following table:

Unit	*Number*
A	0
B	1
C	2
D	3
Config	4

Edit Buffer Dump Message

Message code: 37
Message size: 8 plus data segment size = 334 MIDI bytes

[header]	DP/4 SysEx Header
`00100101`	Edit buffer dump message code
`00000uuu`	`u` = current Active Unit number (0..4)
...	
[data]	Nybblized data block (163 bytes of Edit buffer parameters)
...	
`11110111`	End of Exclusive status byte

4 Preset Structure Descriptions

This is a description of the structure of the preset data blocks transmitted using the bulk dump messages described in section 3. The names and byte offsets of each parameter are given. The parameter value ranges are included the data structure definitions later in this section. Remember that the following byte layout is the DP/4's internal representation and not the MIDI byte format which is described in section 2.3.

Notes about the structures (referenced by note number from the structure descriptions):

1. Preset names are sixteen ASCII characters long, stored as full 8-bit bytes.

2. The Bypass/Kill status parameter indicates whether each unit is bypassed, and whether Kill mode is active. When Kill mode is active, the unit will not pass any signal when it is Bypassed. If Kill mode is not active, then the unit will pass a dry signal when bypassed. The status of the four units is packed into the byte as follows:

`stuvwxyz`	`s` = Unit D Kill mode status	(1=Kill; 0=Bypass)
	`t` = Unit D Bypass status	(1=Bypassed; 0=Un-Bypassed)
	`u` = Unit C Kill mode status	
	`v` = Unit C Bypass status	
	`w` = Unit B Kill mode status	
	`x` = Unit B Bypass status	
	`y` = Unit A Kill mode status	
	`z` = Unit A Bypass status	

3. Algorithm Index — The numbers listed with the algorithm names in section 7 are the values used for the internal algorithm select parameter. *Do not use unlisted values*. Out of range values are trapped by the DP/4 and will default to the No Effect algorithm, but some values will yield unexpected results.

4. The interpretation of the bytes between offset 01 and the Mod 1 Source parameter offset inclusive is dependent on the particular effect algorithm with which they are associated. The algorithm specific bytes for each algorithm are defined sequentially up from offset 01. Not all byte offsets are defined for all algorithms, but consider all apparently unused bytes to be reserved for future use with default values of zero. Refer to the individual algorithm parameter descriptions in section 7.

5. The Modulation Destination parameter maximum value depends on the number of parameters available in the specific algorithm. All defined algorithm parameters except 00 may be selected as the modulation destination.

6. All offsets and parameter ranges are shown as *decimal* values unless otherwise specifically noted.

4.1 Algorithm Parameter Block Structure

Total Size = 34 bytes

This is the basic structure for the Algorithm Parameter Block which is contained in all types of Presets. The elements defined here are common to all effects, with the exception of the Algorithm Specific Parameters (see note 4 above). The maximum value of the two Mod Destination parameters ("p") is the parameter number of the highest defined parameter in each algorithm.

		Parameter Range	
Offset	*Parameter Name*	*Internal*	*Displayed*
00	Algorithm Index		*{see Note #3}*
01..23	< Algorithm Specific Parameters>		*{see Note #4}*
24	Mod 1 Source	0..8	Off, Controller 1..8
25	Mod 1 Destination	0..p	(0 = Off; "p" is variable) *{see Note #5}*
26	Mod 1 Param Range Min	0..127	00..99%
27	Mod 1 Param Range Max	0..127	00..99%
28	Mod 2 Source	0..8	Off, Controller 1..8
29	Mod 2 Destination	0..p	(0 = Off; "p" is variable) *{see Note #5}*
30	Mod 2 Param Range Min	0..127	00..99%
31	Mod 2 Param Range Max	0..127	00..99%
32	Volume	0..127	00..99
33	Mix	0..127	00..99

4.2 Config Preset Structure

Total Size = 163 bytes

This is the structure for one of the Config Presets. This structure is also used for the Edit Buffer Dump sent in response to the Edit Buffer Dump Request message.

Offset	*Description*	
00	Preset size (163)	
01	Preset name	*{see Note #1}*
17	Unit A Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
51	Unit B Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
85	A–B Routing	
86	AB Dry	
87	Unit C Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
121	Unit D Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
155	C–D Routing	
156	CD Dry	
157	AB–CD Routing	
158	Config Type	
159	Config AB Input Select	
160	Config CD Input Select	
161	Config Bypass/Kill Status	*{see Note #2}*
162	Config spare	

4.3 Four Unit Preset Structure

This is the structure for one of the 4U Presets.
Total Size = 158 bytes

Offset	*Description*	
00	Preset size (158)	
01	Preset name	*{see Note #1}*
17	Unit A Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
51	Unit B Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
85	A–B Routing	
86	AB Dry	
87	Unit C Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
121	Unit D Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
155	C–D Routing	
156	CD Dry	
157	AB–CD Routing	

4.4 Two Unit Preset Structure

This is the structure for one of the 2U Presets.
Total Size = 87 bytes

Offset	*Description*	
00	Preset size (87)	
01	Preset name	*{see Note #1}*
17	Unit A (or C) Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
51	Unit B (or D) Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*
85	A–B (or C–D) Routing	
86	AB (or CD) Feedback/Dry	

4.5 One Unit Preset Structure

This is the structure for one of the 1U Presets.
Total Size = 51 bytes

Offset	*Description*	
00	Preset size (51)	
01	Preset name	*{see Note #1}*
17	Unit Algorithm parameters	*{refer to Algo Param Structure, section 4.1}*

5 Configuration Parameters

This is a description of the configuration parameters available in the four different basic system configurations available in Edit Config mode. Each of the four configurations has a different set of configuration parameters.

These lists are ordered by parameter number as displayed on the front panel of the DP/4. All configuration parameter offsets are based on the Config Preset data structure. Refer to the individual preset data structure descriptions in section 4 for the offsets of configuration parameters which also appear in 1U, 2U and 4U presets. All offsets and parameter ranges are shown as *decimal* values unless otherwise specifically noted.

Parameters are listed with the following attributes:

Name	Usually the name of the parameter as displayed on the front panel
Number	Parameter number as displayed
Offset	Position in the Config Preset data structure
Type	Parameter type (see list below)
Internal	Range of legal values as stored internally (decimal)
Displayed	Range of legal values as displayed on the front panel

Parameter types:

Pos Frac	Positive Fraction ranging from 0 to 127 (uses translation table for display – see Fraction Type Translation Table in section 7)
Table	Unsigned byte index to table of *<max>* entries of *<field size>* length

Parameter	*Param*	*Offset*	*Type*	*Internal*	*Displayed*	
Config Select	00	158	Table	0,3	1..4 Source Config	
1 Source Config						
AB - CD Routing	01	157	Table	0,1	Serial,Parallel	
AB Unit Routing	02	85	Table	0,6	(see Note 1)	
CD Unit Routing	03	155	Table	0,6	(see Note 1)	
AB Dry Path/Feedback	04	86	Pos Frac	0,127	0,99	(see Note 2)
CD Dry Path/Feedback	05	156	Pos Frac	0,127	0,99	(see Note 2)
AB Input Select	06	159	Table	0,2	(12) Stereo, (1) Mono, (2) Mono	
Bypass Kill (Unit) A	07	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) B	08	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) C	09	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) D	10	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
2 Source Config						
AB Unit Routing	01	85	Table	0,6	(see Note 1)	
CD Unit Routing	02	155	Table	0,6	(see Note 1)	
AB Input Select	03	159	Table	0,2	(12) Stereo, (1) Mono, (2) Mono	
CD Input Select	04	160	Table	0,2	(34) Stereo, (3) Mono, (4) Mono	
AB Dry Path/Feedback	05	86	Pos Frac	0,127	0,99	(see Note 2)
CD Dry Path/Feedback	06	156	Pos Frac	0,127	0,99	(see Note 2)
Bypass Kill (Unit) A	07	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) B	08	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) C	09	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) D	10	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)

Parameter	*Param*	*Offset*	*Type*	*Internal*	*Displayed*	
3 Source Config						
AB Output Select	01	159	Table	0,1	Dual Mono, Mixed Stereo	
CD Unit Routing	02	86	Table	0,6	(see Note 1)	
CD Input Select	03	160	Table	0,2	(34) Stereo, (3) Mono, (4) Mono	
CD Dry Path/Feedback	04	156	Pos Frac	0,127	0,99	(see Note 2)
Bypass Kill (Unit) A	05	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) B	06	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) C	07	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) D	08	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
4 Source Config						
AB Output Select	01	159	Table	0,1	Dual Mono, Mixed Stereo	
CD Output Select	02	160	Table	0,1	Dual Mono, Mixed Stereo	
Bypass Kill (Unit) A	03	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) B	04	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) C	05	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)
Bypass Kill (Unit) D	06	161	Table	0,1	(b)ypass,(k)ill	(see Note 3)

Notes:

1. The internal parameter range is 0..6, providing 7 possible settings, but only 4 are visible:

   0 Serial 2 Feedback1 4 (separate) 6 Not Available (2 Units ganged)
   1 Parallel 3 Feedback2 5 (illegal)

   Settings 4 & 5 are used for special purposes internally and are translated before display. Setting 4 is translated into Feedback2 and 5 into Not Available.

2. The function and displayed name of this parameter are dependent on the inter-unit routing parameter setting. Feedback routings provide the Feedback parameter, serial routings provide the Dry Path Around parameter, and parallel routings do not use this parameter and show (unconnected).

3. The Bypass/Kill status parameters are packed into a single byte of the config preset which indicates whether each unit is bypassed, and whether Kill mode is active. When Kill mode is active, the unit will not pass any signal when it is Bypassed. If Kill mode is not active, then the unit will pass a dry signal when bypassed. The status of the four units is packed into the byte as follows:

   `stuvwxyz` `s` = Unit D Kill mode status (1=Kill; 0=Bypass)
   `t` = Unit D Bypass status (1=Bypassed; 0=Un-Bypassed)
   `u` = Unit C Kill mode status
   `v` = Unit C Bypass status
   `w` = Unit B Kill mode status
   `x` = Unit B Bypass status
   `y` = Unit A Kill mode status
   `z` = Unit A Bypass status

6 System and MIDI Parameters

This is a description of the System and MIDI parameters available in System mode. The MIDI parameter structures for the five units (A, B, C, D and Config) are identical except for having different offsets. Each of the five units has a 128 byte MIDI program change map associated with it.

Other large data segments include a block containing 20 Songs (preset chains) of 5 bytes each (100 bytes); and a block of 500 bytes of spare system RAM reserved for later system expansion

The MIDI Program Change Map Editor parameters and the Song Editor parameters are used during the editing process only and their values in the dump represent only their last used settings.

This list is ordered by parameter number as displayed on the front panel of the DP/4. All System Parameter offsets are referenced to the base of the System Parameters SysEx Bulk Dump data segment. All offsets and parameter ranges are shown as *decimal* values unless otherwise specifically noted.

Parameters are listed with the following attributes:

Name	Usually the name of the parameter as displayed on the front panel
Number	Parameter number as displayed
Offset	Position in the System Parameters SysEx Bulk Dump data structure
Type	Parameter type (see list below)
Internal	Range of legal values as stored internally (decimal)
Displayed	Range of legal values as displayed on the front panel

Parameter types:

Pos Int	Positive Integer ranging from 0 to 99
Offset+1	Similar to Pos Int but displayed with an offset of +1.
Table	Unsigned byte index to table of *<max>* entries of *<field size>* length
Switch	Special table type with fixed two value range (0,1)

Parameter	*Param*	*Offset*	*Type*	*Internal*	*Displayed*
Unit A MIDI parameters					
MIDI Channel	00	02	Offset+1	0,15	1,16
MIDI Enable	01	03	Table	0,1	Disabled, Enabled
Program Change Enable	02	16	Table	0,1	Ignored, Received
Program Change Map Enable	03	21	Table	0,1	Off, On
Program Change-to-Preset Map Editor					
MIDI PC Number	04	26	Offset+1	0,127	1,128
Selects DP/4 Preset	05	31	Pos Int	0,103	0..99,Bypass,Unbypass,Kill,Ignore
Program Change-to-Preset Map		36	(128 byte table of DP/4 presets indexed by MIDI PC number)		
Unit Bypass Controller	06	696	Table	0,137	(see Section 6 parameter description)
Unit B MIDI parameters					
MIDI Channel	07	04	Offset+1	0,15	1,16
MIDI Enable	08	05	Table	0,1	Disabled, Enabled
Program Change Enable	09	17	Table	0,1	Ignored, Received
Program Change Map Enable	10	22	Table	0,1	Off, On
Program Change-to-Preset Map Editor					
MIDI PC Number	11	27	Offset+1	0,127	1,128
Selects DP/4 Preset	12	32	Pos Int	0,103	0..99,Bypass,Unbypass,Kill,Ignore
Program Change-to-Preset Map		164	(128 byte table of DP/4 presets indexed by MIDI PC number)		
Unit Bypass Controller	13	697	Table	0,137	(see Section 6 parameter description)

Parameter	*Param*	*Offset*	*Type*	*Internal*	*Displayed*
Unit C MIDI parameters					
MIDI Channel	14	06	Offset+1	0,15	1,16
MIDI Enable	15	07	Table	0,1	Disabled, Enabled
Program Change Enable	16	18	Table	0,1	Ignored, Received
Program Change Map Enable	17	23	Table	0,1	Off, On
Program Change-to-Preset Map Editor					
MIDI PC Number	18	28	Offset+1	0,127	1,128
Selects DP/4 Preset	19	33	Pos Int	0,103	0..99,Bypass,Unbypass,Kill,Ignore
Program Change-to-Preset Map		292	(128 byte table of DP/4 presets indexed by MIDI PC number)		
Unit Bypass Controller	20	698	Table	0,137	(see Section 6 parameter description)
Unit D MIDI parameters					
MIDI Channel	21	08	Offset+1	0,15	1,16
MIDI Enable	22	09	Table	0,1	Disabled, Enabled
Program Change Enable	23	19	Table	0,1	Ignored, Received
Program Change Map Enable	24	24	Table	0,1	Off, On
Program Change-to-Preset Map Editor					
MIDI PC Number	25	29	Offset+1	0,127	1,128
Selects DP/4 Preset	26	34	Pos Int	0,103	0..99,Bypass,Unbypass,Kill,Ignore
Program Change-to-Preset Map		420	(128 byte table of DP/4 presets indexed by MIDI PC number)		
Unit Bypass Controller	27	699	Table	0,137	(see Section 6 parameter description)
Config "Unit" MIDI parameters					
MIDI Channel	28	10	Offset+1	0,15	1,16
MIDI Enable	29	11	Table	0,1	Disabled, Enabled
Program Change Enable	30	20	Table	0,1	Ignored, Received
Program Change Map Enable	31	25	Table	0,1	Off, On
Program Change-to-Preset Map Edit					
MIDI PC Number	32	30	Offset+1	0,127	1,128
Selects DP/4 Preset	33	35	Pos Int	0,103	0..99,Bypass,Unbypass,Kill,Ignore
Program Change-to-Preset Map		548	(128 byte table of DP/4 presets indexed by MIDI PC number)		
Unit Bypass Controller	34	700	Table	0,137	(see Section 6 parameter description)
General System parameters					
MIDI Control Channel	35	12	Offset+1	0,15	1,16
MIDI Controller Reception	36	13	Switch	0,1	Disabled, Enabled
DP/4 Controller 1	37	677	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 2	38	678	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 3	39	679	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 4	40	680	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 5	41	681	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 6	42	682	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 7	43	683	Table	0,137	(see Section 6 parameter description)
DP/4 Controller 8	44	684	Table	0,137	(see Section 6 parameter description)
DP/4 Foot Switch 1	45	701	Table	0,7	(see Section 6 parameter description)
DP/4 Foot Switch 2	46	702	Table	0,7	(see Section 6 parameter description)

Parameter	*Param*	*Offset*	*Type*	*Internal*	*Displayed*
Song Editor					
Define Song	47	703	Offset+1	0,19	1,20
Define Step	48	704	Offset+1	0,4	1,5
Define Preset	49	705	Pos Int	0,100	0,99,Goto Step 1
Song Data Array		706			
Spare System Data		806			
MIDI System Exclusive ID	50	15	Offset+1	0,15	1,16
MIDI SysEx Reception Enable	51	14	Switch	0,1	Disabled, Enabled
Preset Memory Protect	52	687	Switch	0,1	Off, On
MIDI Prog Change Master Switch	53	676	Switch	0,1	Off, On
Parameter Wrap Feature	54	685	Switch	0,1	Off, On
Auto-load Preset (Select Mode)	55	686	Switch	0,1	Off, On
Set All 1U Preset Mixes To Wet	56	688	Switch	0,1	No, Yes
Receive Control 7 On Unit Chan	57	689	Switch	0,1	No, Yes
Send MIDI PrgChg & Controllers	58	691	Switch	0,1	No, Yes
Show 100 Config Presets	59	690	Switch	0,1	No, Yes
Data Entry Knob Response	60	1306	Table	0,2	Fast,Normal,Slow
Modulation Response Rate	61	1307	Pos Int	1,30	1,30
Use Alternate ROM Presets	62	1308	Switch	0,1	No, Yes
<3 spare reserved bytes>		1309			
Operating System Version	63	0	(Two byte binary coded decimal version number indicating which OS ROM version originated the dump. Note that this is intended as a read only parameter and the value should not be modified)		

7 Algorithm Parameters

Parameter 00 is listed in the following parameter descriptions with the algorithm name and algorithm index values used for the internal algorithm select parameter. *Do not use unlisted values*. Out of range values are trapped by the DP/4 and will default to the No Effect algorithm, but other unlisted values may yield unexpected results.

These lists are ordered by parameter number as displayed on the front panel of the DP/4. All algorithm parameter offsets are referenced to the base of the Algorithm Parameter Block Structure (see section 4.1). Offset 00 is always the Algorithm Index and the first byte of the algorithm specific segment is considered to be 01 in these descriptions. All offsets and parameter ranges are shown as *decimal* values unless otherwise specifically noted.

Parameters are listed with the following attributes:

Name	Usually the name of the parameter as displayed on the front panel.
Number	Parameter number as displayed.
Offset	Position in the Algorithm Parameter Block Structure (see section 4.1).
Type	Parameter type (see list below).
Internal	Range of legal values (<*min*>,<*max*>) as stored internally (decimal).
Displayed	Range of legal values as displayed on the front panel (decimal).

Parameter types:

Pos Int	Positive Integer ranging from 0 to 99.
Signed Int	Two's complement Signed Integer ranging from 0 to 127.
Pos Frac	Positive Fraction ranging from 0 to 127. This type uses the translation table for display.
Signed Frac	Two's complement Signed Fraction ranging from -128 to 127. This type uses the translation table for display.
Word	16 bit (2 bytes) unsigned value ranging from 0 to 65535.
Word 2	Similar to the Word type with a fixed minimum value of 100.
Table	Unsigned byte index to table of <*max*>+1 entries of <*field size*> length.
Function	This type has no editable value and is used for the gain metering function in several algorithms.

Fraction Type Translation Table

For "Fraction–type" parameters which are displayed as [0..99] or [-99..99] but stored internally as [0..127] or [-128..127], the following conversion table of 129 bytes is used to translate the internal values into displayed values. For negative internal values (80h..FFh), use the two's complement of the value to get the table index (128..1) to use. There are sixteen entries per line in the table, with one extra value on the end to catch the maximum negative value -128 (80h) whose two's complement is 128.

00,01,01,02,03,04,04,05,06,07,08,08,09,10,11,12
12,13,14,15,15,16,17,18,19,19,20,21,22,22,23,24
25,26,26,27,28,29,29,30,31,32,33,33,34,35,36,36
37,38,39,40,40,41,42,43,44,44,45,46,47,47,48,49
50,51,51,52,53,54,54,55,56,57,58,58,59,60,61,62
62,63,64,65,65,66,67,68,69,69,70,71,72,72,73,74
75,76,76,77,78,79,79,80,81,82,83,83,84,85,86,86
87,88,89,90,90,91,92,93,94,94,95,96,97,97,98,99,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Small Room Rev, Large Room Rev, Hall Reverb					
Algorithm index codes 01,02,03 : 20 unique pdefs : 30 total params					
Mix	01	33	Pos Frac	0,127	0,99
Volume	02	32	Pos Frac	0,127	0,99
Room/Hall Decay	03	01	Table	0,127	Field size: 4
Room/Hall Predelay Time	04	10	Word	0,450	0,450
Room/Hall LF DecayTime	05	02	Signed Frac	-128,127	-99,99
Room/Hall HF Damping	06	03	Pos Frac	0,127	0,99
Room/Hall HF Bandwidth	07	04	Pos Frac	2,127	1,99
Room/Hall Diffusion1	08	05	Pos Int	0,99	0,99
Room/Hall Diffusion2	09	06	Pos Int	0,99	0,99
Room/Hall Decay Definition	10	07	Pos Frac	0,127	0,99
Room/Hall Detune Rate	11	08	Pos Int	0,99	0,99
Room/Hall Detune Depth	12	09	Pos Frac	0,127	0,99
Room/Hall Primary Send	13	12	Signed Frac	-128,127	-99,99
Room/Hall Ref 1 Time	14	13	Word	0,120	0,120
Room/Hall Ref 1 Level	15	19	Pos Frac	0,127	0,99
Room/Hall Ref 1 Send	16	15	Pos Frac	0,127	0,99
Room/Hall Ref 2 Time	17	16	Word	0,120	0,120
Room/Hall Ref 2 Level	18	20	Pos Frac	0,127	0,99
Room/Hall Ref 2 Send	19	18	Pos Frac	0,127	0,99
Position Balance (1)	20	21	Signed Frac	-128,127	-99,99
Position Balance (2)	21	22	Signed Frac	-128,127	-99,99
Position Balance (3)	22	23	Signed Frac	-128,127	-99,99
Mod1 Source	23	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	24	25	Pos Int	0,127	0,99
Mod1 Param Range Min	25	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	26	27	Pos Frac	0,127	0,99
Mod2 Source	27	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	28	29	Pos Int	0,127	0,99
Mod2 Param Range Min	29	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	30	31	Pos Frac	0,127	0,99
00 — Small Plate, Large Plate					
Algorithm index codes 05,06 : 12 unique pdefs : 22 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Small/Large Plate Decay	03	01	Table	0,127	Field size: 4
Plate Predelay Time	04	07	Word	0,430	0,430
Small/Large Plate HF Damping	05	02	Pos Frac	0,127	0,99
Small/Large Plate HF Bandwidth	06	03	Pos Frac	2,127	1,99
Plate Diffusion 1	07	04	Pos Int	0,99	0,99
Plate Diffusion 2	08	05	Pos Int	0,99	0,99
Plate Decay Definition	09	06	Pos Frac	0,127	0,99
Early Ref Level 1	10	09	Signed Frac	-128,127	-99,99
Early Ref Level 2	11	10	Signed Frac	-128,127	-99,99
Early Ref Level 3	12	11	Signed Frac	-128,127	-99,99
Early Ref Level 4	13	12	Signed Frac	-128,127	-99,99
Left/Right Balance	14	23	Signed Frac	-128,127	-99,99
Mod1 Source	15	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	16	25	Pos Int	0,127	0,99
Mod1 Param Range Min	17	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	18	27	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
Mod2 Source	19	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	20	29	Pos Int	0,127	0,99
Mod2 Param Range Min	21	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	22	31	Pos Frac	0,127	0,99

00 — Reverse Reverb

Algorithm index code 08 : 10 unique pdefs : 20 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Reverse Envelope Hold Time	03	01	Table	0,62	Field size: 5
Reverse Attack	04	02	Table	0,62	Field size: 5
Reverse Release	05	03	Table	0,62	Field size: 5
Reverse Trigger Threshold	06	04	Signed Int	-96,0	-96,0
Reverse HF Damping	07	05	Pos Frac	0,127	0,99
Rev Diffusion 1	08	06	Pos Int	0,99	0,99
Rev Diffusion 2	09	07	Pos Int	0,99	0,99
Reverse Decay Definition	10	08	Pos Frac	0,127	0,99
Reverse Slapback	11	09	Word	0,530	0,530
Reverse Slapback Level	12	11	Pos Frac	0,127	0,99
Mod1 Source	13	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	14	25	Pos Int	0,127	0,99
Mod1 Param Range Min	15	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	16	27	Pos Frac	0,127	0,99
Mod2 Source	17	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	18	29	Pos Int	0,127	0,99
Mod2 Param Range Min	19	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	20	31	Pos Frac	0,127	0,99

00 — Reverse Reverb 2

Algorithm index code 54 : 09 unique pdefs : 19 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Reverse Envelope Hold Time	03	01	Table	0,62	Field size: 5
Reverse Attack	04	02	Table	0,62	Field size: 5
Reverse Release	05	03	Table	0,62	Field size: 5
Reverse Trigger Threshold	06	04	Signed Int	-96,0	-96,0
Pre-Trigger Memory	07	12	Word	0,530	0,530
Reverse HF Damping	08	05	Pos Frac	0,127	0,99
Rev Diffusion 1	09	06	Pos Int	0,99	0,99
Rev Diffusion 2	10	07	Pos Int	0,99	0,99
Reverse Decay Definition	11	08	Pos Frac	0,127	0,99
Mod1 Source	12	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	13	25	Pos Int	0,127	0,99
Mod1 Param Range Min	14	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	15	27	Pos Frac	0,127	0,99
Mod2 Source	16	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	17	29	Pos Int	0,127	0,99
Mod2 Param Range Min	18	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	19	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Gated Reverb					
Algorithm index code 07 : 17 unique pdefs : 27 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Gate Attack	03	01	Table	0,62	Field size: 5
Hold Time	04	02	Table	0,62	Field size: 5
Gate Decay	05	03	Table	0,127	Field size: 4
Release Time	06	04	Table	0,62	Field size: 5
Gate Trigger Threshold	07	05	Signed Int	-96,0	-96,0
Gated Retrigger Threshold	08	06	Signed Int	-96,0	-96,0
Gated HF Damping	09	07	Pos Frac	0,127	0,99
Gated Diffusion 1	10	08	Pos Int	0,99	0,99
Gated Diffusion 2	11	09	Pos Int	0,99	0,99
Gated Decay Definition	12	10	Pos Frac	0,127	0,99
Gated Slapback	13	11	Word	0,500	0,500
Gated Slapback Level	14	13	Pos Frac	0,127	0,99
Early Refs (1)	15	14	Signed Frac	-128,127	-99,99
Early Refs (2)	16	15	Signed Frac	-128,127	-99,99
Early Refs (3)	17	16	Signed Frac	-128,127	-99,99
Early Refs (4)	18	17	Signed Frac	-128,127	-99,99
Left/Right Balance	19	23	Signed Frac	-128,127	-99,99
Mod1 Source	20	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	21	25	Pos Int	0,127	0,99
Mod1 Param Range Min	22	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	23	27	Pos Frac	0,127	0,99
Mod2 Source	24	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	25	29	Pos Int	0,127	0,99
Mod2 Param Range Min	26	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	27	31	Pos Frac	0,127	0,99
00 — Non Lin Reverb 1, 2, 3					
Algorithm index codes 04,46,59 : 21 unique pdefs : 31 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Envelope Level 1	03	01	Pos Frac	0,127	0,99
Envelope Level 2	04	02	Pos Frac	0,127	0,99
Envelope Level 3	05	03	Pos Frac	0,127	0,99
Envelope Level 4	06	04	Pos Frac	0,127	0,99
Envelope Level 5	07	05	Pos Frac	0,127	0,99
Envelope Level 6	08	06	Pos Frac	0,127	0,99
Envelope Level 7	09	07	Pos Frac	0,127	0,99
Envelope Level 8	10	08	Pos Frac	0,127	0,99
Envelope Level 9	11	09	Pos Frac	0,127	0,99
NonLin HF Damping	12	10	Pos Frac	0,127	0,99
NonLin HF Bandwidth	13	11	Pos Frac	2,127	1,99
NonLin Diffusion1	14	12	Pos Int	0,99	0,99
NonLin Diffusion2	15	13	Pos Int	0,99	0,99
NonLin Density 1	16	14	Pos Int	0,99	0,99
NonLin Density 2	17	15	Pos Int	0,99	0,99
NonLin Primary Send	18	16	Signed Frac	-128,127	-99,99
Reflection 1 Time	19	17	Word	0,600	0,600
Reflection 1 Send	20	19	Signed Frac	-128,127	-99,99
Reflection 2 Time	21	20	Word	0,600	0,600
Reflection 2 Send	22	22	Signed Frac	-128,127	-99,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
Left/Right Balance	23	23	Signed Frac	-128,127	-99,99
Mod1 Source	24	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	25	25	Pos Int	0,127	0,99
Mod1 Param Range Min	26	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	27	27	Pos Frac	0,127	0,99
Mod2 Source	28	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	29	29	Pos Int	0,127	0,99
Mod2 Param Range Min	30	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	31	31	Pos Frac	0,127	0,99

00 — MultiTap Delay

Algorithm index code 09 : 17 unique pdefs : 27 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
MultiTap 1 Time	03	01	Word	0,1834	0,1834
MultiTap 1 Level	04	03	Pos Frac	0,127	0,99
MultiTap 1 Regen	05	04	Pos Frac	0,127	0,99
MultiTap 1 Pan	06	05	Signed Frac	-128,127	-99,99
MultiTap 2 Time	07	06	Word	0,1834	0,1834
MultiTap 2 Level	08	08	Pos Frac	0,127	0,99
MultiTap 2 Regen	09	09	Pos Frac	0,127	0,99
MultiTap 2 Pan	10	10	Signed Frac	-128,127	-99,99
MultiTap 3 Time	11	11	Word	0,1834	0,1834
MultiTap 3 Level	12	13	Pos Frac	0,127	0,99
MultiTap 3 Regen	13	14	Pos Frac	0,127	0,99
MultiTap 3 Pan	14	15	Signed Frac	-128,127	-99,99
MultiTap 4 Time	15	16	Word	0,1834	0,1834
MultiTap 4 Level	16	18	Pos Frac	0,127	0,99
MultiTap 4 Regen	17	19	Pos Frac	0,127	0,99
MultiTap 4 Pan	18	20	Signed Frac	-128,127	-99,99
Regen Damping	19	21	Pos Frac	0,127	0,99
Mod1 Source	20	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	21	25	Pos Int	0,127	0,99
Mod1 Param Range Min	22	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	23	27	Pos Frac	0,127	0,99
Mod2 Source	24	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	25	29	Pos Int	0,127	0,99
Mod2 Param Range Min	26	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	27	31	Pos Frac	0,127	0,99

00 — 3.3 sec DDL 2U

Algorithm index code 43 (44) : 06 unique pdefs : 16 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
3.3 Sec Delay Time	03	01	Word	0,3668	0,3668
3.3 Sec Delay Regen	04	03	Pos Frac	0,127	0,99
3.3 Sec Delay Pan	05	04	Signed Frac	-128,127	-99,99
3.3 Sec Delay Regen Damping	06	05	Pos Frac	0,127	0,99
3.3 sec Delay Mode	07	10	Table	0,3	Field size: 11
DelaySet	08	11	Table	0,8	Off,Controller 1..8
Mod1 Source	09	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	10	25	Pos Int	0,127	0,99
Mod1 Param Range Min	11	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	12	27	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
Mod2 Source	13	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	14	29	Pos Int	0,127	0,99
Mod2 Param Range Min	15	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	16	31	Pos Frac	0,127	0,99
00 — Dual Delay					
Algorithm index code 10 : 10 unique pdefs : 20 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Left Input Delay Time	03	01	Word	0,840	0,840
Left Input Delay Time (fine)	04	03	Pos Int	0,99	0,99
Left Input Delay Regen	05	04	Pos Frac	0,127	0,99
Left Input Delay Pan	06	05	Signed Frac	-128,127	-99,99
Right Input Delay Time	07	06	Word	0,840	0,840
Right Input Delay Time (fine)	08	08	Pos Int	0,99	0,99
Right Input Delay Regen	09	09	Pos Frac	0,127	0,99
Right Input Delay Pan	10	10	Signed Frac	-128,127	-99,99
Dual Delay CrossRegen	11	11	Signed Frac	-128,127	-99,99
Dual Delay Regen Damping	12	12	Pos Frac	0,127	0,99
Mod1 Source	13	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	14	25	Pos Int	0,127	0,99
Mod1 Param Range Min	15	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	16	27	Pos Frac	0,127	0,99
Mod2 Source	17	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	18	29	Pos Int	0,127	0,99
Mod2 Param Range Min	19	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	20	31	Pos Frac	0,127	0,99
00 — Tempo Delay					
Algorithm index code 11 : 07 unique pdefs : 17 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Tempo Delay Time	03	01	Table	0,11	Field size: 12
Internal Clock Tempo	04	02	Pos Int	50,250	50,250
TempoDelay Fine Tune	05	04	Signed Int	-99,99	-99,99
Tempo Control	06	03	Table	0,2	Field size: 14
Tempo Delay Regen	07	05	Pos Frac	0,127	0,99
Tempo Delay Pan	08	06	Signed Frac	-128,127	-99,99
Tempo Delay Regen Damping	09	07	Pos Frac	0,127	0,99
Mod1 Source	10	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	11	25	Pos Int	0,127	0,99
Mod1 Param Range Min	12	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	13	27	Pos Frac	0,127	0,99
Mod2 Source	14	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	15	29	Pos Int	0,127	0,99
Mod2 Param Range Min	16	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	17	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — EQ-DDL-withLFO					
Algorithm index code 53 : 15 unique pdefs : 25 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
DDL+LFO Left Delay Time	03	05	Word	0,845	0,845
DDL+LFO Right Delay Time	04	07	Word	0,845	0,845
DDL+LFO LFO Rate	05	01	Pos Int	0,99	0,99
DDL+LFO LFO Width	06	02	Pos Int	0,99	0,99
Left/Right LFO	07	03	Table	0,1	Field size: 13
DDL+LFO Delay Regen	08	09	Signed Frac	-128,127	-99,99
DDL+LFO Delay Cross Regen	09	14	Signed Frac	-128,127	-99,99
DDL+LFO Regen Damping	10	15	Pos Frac	0,127	0,99
DDL+LFO Right Delay Input	11	16	Table	0,1	Field size: 3
DDL+LFO Right Output Level	12	10	Pos Frac	0,127	0,99
Bass Fc	13	19	Word	0,1000	0,1000
Bass EQ Gain	14	21	Signed Int	-48,24	-48,24
Treble Fc	15	22	Pos Int	1,16	1,16
Treble EQ Gain	16	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	17	18	Signed Int	-24,0	-24,0
Mod1 Source	18	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	19	25	Pos Int	0,127	0,99
Mod1 Param Range Min	20	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	21	27	Pos Frac	0,127	0,99
Mod2 Source	22	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	23	29	Pos Int	0,127	0,99
Mod2 Param Range Min	24	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	25	31	Pos Frac	0,127	0,99
00 — VCF-Distortion					
Algorithm index code 14 : 12 unique pdefs : 22 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Distortion Level In	03	01	Pos Frac	0,127	0,99
Distortion Level Out	04	02	Pos Frac	0,127	0,99
Pre-Distortion VCF Fc	05	03	Pos Int	1,99	1,99
Pre-Distortion VCF Q	06	04	Pos Int	1,25	1,25
Envelope Follower to Pre VCF	07	05	Signed Frac	-128,127	-99,99
Post-Distortion VCF Fc	08	08	Pos Int	1,99	1,99
Post-Distortion VCF Q	09	09	Pos Int	1,25	1,25
Envelope Follower to Post VCF	10	10	Signed Frac	-128,127	-99,99
Envelope Follower Attack	11	06	Table	0,58	Field size: 5
Envelope Follower Release	12	07	Table	0,53	Field size: 5
Distortion Bypass	13	11	Table	0,1	Field size: 3
Pre-EQ High Pass Cutoff	14	12	Word	0,1000	0,1000
Mod1 Source	15	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	16	25	Pos Int	0,127	0,99
Mod1 Param Range Min	17	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	18	27	Pos Frac	0,127	0,99
Mod2 Source	19	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	20	29	Pos Int	0,127	0,99
Mod2 Param Range Min	21	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	22	31	Pos Frac	0,127	0,99

Name	Number	Offset	Type	Internal	Displayed
00 — Guitar Amp 1, Guitar Amp 2					
Algorithm index codes 13,27 : 19 unique pdefs : 29 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Amp Preamp Gain	03	01	Signed Int	-48,48	-48,48
Amp Output Level	04	02	Pos Frac	0,127	0,99
Amp Tube Bias	05	03	Pos Frac	0,127	0,99
Pre-EQ Input Level Trim	06	23	Signed Int	-24,0	-24,0
Pre-EQ High Pass Cutoff	07	04	Table	0,31	Field size: 4
Pre-EQ Fc	08	06	Word 2	100,9999	100,9999
Pre-EQ Gain	09	08	Signed Int	-48,24	-48,24
Pre-EQ Q	10	09	Pos Int	1,18	1,18
Noise Gate Off Below	11	10	Signed Int	-96,0	-96,0
Noise Gate On Above	12	11	Signed Int	-96,0	-96,0
Gate Release Time	13	13	Table	0,53	Field size: 5
Speaker High Pass Cutoff	14	12	Table	0,31	Field size: 4
OutEQ1 Fc	15	14	Word 2	100,9999	100,9999
OutEQ1 Gain	16	16	Signed Int	-48,24	-48,24
OutEQ1 Q	17	17	Pos Int	1,18	1,18
OutEQ2 Fc	18	18	Word 2	100,9999	100,9999
OutEQ2 Gain	19	20	Signed Int	-48,24	-48,24
OutEQ2 Q	20	21	Pos Int	1,18	1,18
Speaker Low Pass Cutoff	21	22	Table	0,9	Field size: 4
Mod1 Source	22	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	23	25	Pos Int	0,127	0,99
Mod1 Param Range Min	24	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	25	27	Pos Frac	0,127	0,99
Mod2 Source	26	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	27	29	Pos Int	0,127	0,99
Mod2 Param Range Min	28	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	29	31	Pos Frac	0,127	0,99
00 — Guitar Amp 3					
Algorithm index code 50 : 20 unique pdefs : 30 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
AmpPreamp Gain	03	01	Signed Int	-48,48	-48,48
Amp Output Level	04	02	Pos Frac	0,127	0,99
PreEQ Input Level Trim	05	23	Signed Int	-24,0	-24,0
Pre-EQ Fc	06	06	Word 2	100,9999	100,9999
Pre-EQ Gain	07	08	Signed Int	-48,24	-48,24
Pre-EQ Q	08	09	Pos Int	1,18	1,18
ExpndRatio	09	03	Table	0,34	Field size: 3
Threshold	10	04	Signed Int	-96,0	-96,0
Gain Change	11	–	Function	(Gain Meter : non-editable parameter	
Noise Gate Off Below	12	10	Signed Int	-96,0	-96,0
Noise Gate On Above	13	11	Signed Int	-96,0	-96,0
Gate Release Time	14	13	Table	0,53	Field size: 5
Speaker High Pass Cutoff	15	12	Table	0,31	Field size: 4
OutEQ1 Fc	16	14	Word 2	100,9999	100,9999
OutEQ1 Gain	17	16	Signed Int	-48,24	-48,24
OutEQ1 Q	18	17	Pos Int	1,18	1,18
OutEQ2 Fc	19	18	Word 2	100,9999	100,9999
OutEQ2 Gain	20	20	Signed Int	-48,24	-48,24

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
OutEQ2 Q	21	21	Pos Int	1,18	1,18
Speaker Low Pass Cutoff	22	22	Table	0,9	Field size: 4
Mod1 Source	23	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	24	25	Pos Int	0,127	0,99
Mod1 Param Range Min	25	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	26	27	Pos Frac	0,127	0,99
Mod2 Source	27	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	28	29	Pos Int	0,127	0,99
Mod2 Param Range Min	29	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	30	31	Pos Frac	0,127	0,99

00 — Speaker Cabinet

Algorithm index code 15 : 01 unique pdefs : 11 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Speaker Output Gain	03	13	Signed Int	-48,24	-48,24
Mod1 Source	04	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	05	25	Pos Int	0,127	0,99
Mod1 Param Range Min	06	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	07	27	Pos Frac	0,127	0,99
Mod2 Source	08	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	09	29	Pos Int	0,127	0,99
Mod2 Param Range Min	10	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	11	31	Pos Frac	0,127	0,99

00 — Tunable Speaker

Algorithm index code 45 : 11 unique pdefs : 21 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Mid1 Fc	03	01	Word 2	100,9999	100,9999
Mid1 Gain	04	03	Signed Int	-48,24	-48,24
Mid1 Q	05	04	Pos Int	1,18	1,18
Mid2 Fc	06	05	Word 2	100,9999	100,9999
Mid2 Gain	07	07	Signed Int	-48,24	-48,24
Mid2 Q	08	08	Pos Int	1,18	1,18
Mid3 Fc	09	09	Word 2	100,9999	100,9999
Mid3 Gain	10	11	Signed Int	-48,24	-48,24
Mid3 Q	11	12	Pos Int	1,18	1,18
Speaker Input Attenuation	12	14	Signed Int	-24,0	-24,0
Speaker Output Gain	13	13	Signed Int	-48,24	-48,24
Mod1 Source	14	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	15	25	Pos Int	0,127	0,99
Mod1 Param Range Min	16	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	17	27	Pos Frac	0,127	0,99
Mod2 Source	18	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	19	29	Pos Int	0,127	0,99
Mod2 Param Range Min	20	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	21	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Rotating Speaker					
Algorithm index code 16 : 08 unique pdefs : 18 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Rotating Speaker Slow Speed	03	02	Pos Int	1,55	1,55
Rotating Speaker Fast Speed	04	03	Pos Int	1,55	1,55
Rotating Speaker Speed	05	01	Table	0,1	Field size: 4
Rotating Speaker Inertia	06	09	Pos Frac	0,127	0,99
Distortion Level In	07	04	Signed Int	-48,48	-48,48
Distortion Level Out	08	05	Pos Frac	0,127	0,99
Rotating Speaker Distortion Tone	09	06	Pos Int	0,127	0,127
Rotating Speaker Stereo Spread	10	08	Pos Frac	0,127	0,99
Mod1 Source	11	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	12	25	Pos Int	0,127	0,99
Mod1 Param Range Min	13	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	14	27	Pos Frac	0,127	0,99
Mod2 Source	15	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	16	29	Pos Int	0,127	0,99
Mod2 Param Range Min	17	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	18	31	Pos Frac	0,127	0,99
00 — EQ-Chorus-DDL					
Algorithm index code 22 : 15 unique pdefs : 25 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Chorus LFO Rate	03	01	Pos Int	0,99	0,99
Chorus LFO Width	04	02	Pos Frac	0,127	0,99
Chorus Center	05	04	Pos Frac	0,127	0,99
Left/Right LFO	06	03	Table	0,1	Field size: 13
Chorus Left Delay Time	07	05	Word	0,1500	0,1500
Chorus Right Delay Time	08	07	Word	0,1500	0,1500
Chorus Delay Regen	09	09	Signed Frac	-128,127	-99,99
Chorus Left Echo Time	10	10	Word	0,1500	0,1500
Chorus Right Echo Time	11	12	Word	0,1500	0,1500
Chorus Echo Level	12	14	Pos Frac	0,127	0,99
Bass Fc	13	19	Word	0,1000	0,1000
Bass EQ Gain	14	21	Signed Int	-48,24	-48,24
Treble Fc	15	22	Pos Int	1,16	1,16
Treble EQ Gain	16	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	17	18	Signed Int	-24,0	-24,0
Mod1 Source	18	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	19	25	Pos Int	0,127	0,99
Mod1 Param Range Min	20	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	21	27	Pos Frac	0,127	0,99
Mod2 Source	22	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	23	29	Pos Int	0,127	0,99
Mod2 Param Range Min	24	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	25	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — EQ-Vibrato-DDL					
Algorithm index code 39 : 15 unique pdefs : 25 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Vibrato Rate	03	01	Pos Int	0,99	0,99
Vibrato Width	04	02	Pos Frac	0,127	0,99
Left/Right LFO	05	03	Table	0,1	Field size: 13
Vibrato Sample & Hold Rate	06	17	Pos Int 2	0,100	0,100
Vibrato Left Delay Time	07	04	Word	0,1500	0,1500
Vibrato Right Delay Time	08	06	Word	0,1500	0,1500
Vibrato Delay Regen	09	08	Signed Frac	-128,127	-99,99
Vibrato Left Echo Time	10	09	Word	0,1500	0,1500
Vibrato Right Echo Time	11	11	Word	0,1500	0,1500
Vibrato Echo Level	12	13	Pos Frac	0,127	0,99
Bass Fc	13	19	Word	0,1000	0,1000
Bass EQ Gain	14	21	Signed Int	-48,24	-48,24
Treble Fc	15	22	Pos Int	1,16	1,16
Treble EQ Gain	16	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	17	18	Signed Int	-24,0	-24,0
Mod1 Source	18	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	19	25	Pos Int	0,127	0,99
Mod1 Param Range Min	20	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	21	27	Pos Frac	0,127	0,99
Mod2 Source	22	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	23	29	Pos Int	0,127	0,99
Mod2 Param Range Min	24	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	25	31	Pos Frac	0,127	0,99
00 — EQ-Panner-DDL					
Algorithm index code 40 : 15 unique pdefs : 25 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Panner Rate	03	01	Pos Int	0,99	0,99
Panner Width	04	02	Pos Frac	0,127	0,99
Left/Right LFO	05	03	Table	0,1	Field size: 13
Panner Sample & Hold Rate	06	17	Pos Int 2	0,100	0,100
Panner Left Delay Time	07	04	Word	0,1500	0,1500
Panner Right Delay Time	08	06	Word	0,1500	0,1500
Panner Delay Regen	09	08	Signed Frac	-128,127	-99,99
Panner Left Echo Time	10	09	Word	0,1500	0,1500
Panner Right Echo Time	11	11	Word	0,1500	0,1500
Panner Echo Level	12	13	Pos Frac	0,127	0,99
Bass Fc	13	19	Word	0,1000	0,1000
Bass EQ Gain	14	21	Signed Int	-48,24	-48,24
Treble Fc	15	22	Pos Int	1,16	1,16
Treble EQ Gain	16	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	17	18	Signed Int	-24,0	-24,0
Mod1 Source	18	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	19	25	Pos Int	0,127	0,99
Mod1 Param Range Min	20	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	21	27	Pos Frac	0,127	0,99
Mod2 Source	22	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	23	29	Pos Int	0,127	0,99
Mod2 Param Range Min	24	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	25	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — EQ-Flanger-DDL					
Algorithm index code 47 : 18 unique pdefs : 28 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Flanger LFO Rate	03	01	Pos Int	0,99	0,99
Flanger LFO Width	04	02	Pos Frac	0,127	0,99
Flanger Center	05	04	Pos Frac	0,127	0,99
Flanger Feedback	06	06	Signed Frac	-127,127	-98,99
Flanger Notch Depth	07	05	Signed Frac	-128,127	-99,99
Left/Right LFO	08	03	Table	0,1	Field size: 13
Flanger Sample & Hold Rate	09	17	Pos Int 2	0,100	0,100
Flanger Left Delay Time	10	07	Word	0,1500	0,1500
Flanger Right Delay Time	11	09	Word	0,1500	0,1500
Flanger Delay Feedback	12	11	Signed Frac	-128,127	-99,99
Flanger Left Echo Time	13	12	Word	0,1500	0,1500
Flanger Right Echo Time	14	14	Word	0,1500	0,1500
Flanger Echo Level	15	16	Pos Frac	0,127	0,99
Bass Fc	16	19	Word	0,1000	0,1000
EQ Gain	17	21	Signed Int	-48,24	-48,24
Treble Fc	18	22	Pos Int	1,16	1,16
EQ Gain	19	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	20	18	Signed Int	-24,0	-24,0
Mod1 Source	21	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	22	25	Pos Int	0,127	0,99
Mod1 Param Range Min	23	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	24	27	Pos Frac	0,127	0,99
Mod2 Source	25	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	26	29	Pos Int	0,127	0,99
Mod2 Param Range Min	27	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	28	31	Pos Frac	0,127	0,99
00 — EQ-Tremolo-DDL					
Algorithm index code 38 : 15 unique pdefs : 25 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Tremolo Rate	03	01	Pos Int	0,200	0,200
Tremolo Depth	04	02	Pos Frac	0,127	0,99
Left/Right LFO	05	03	Table	0,1	Field size: 13
Tremolo Sample & Hold Rate	06	17	Pos Int 2	0,100	0,100
Tremolo Left Delay Time	07	05	Word	0,1500	0,1500
Tremolo Right Delay Time	08	07	Word	0,1500	0,1500
Tremolo Delay Regen	09	09	Signed Frac	-128,127	-99,99
Tremolo Left Echo Time	10	10	Word	0,1500	0,1500
Tremolo Right Echo Time	11	12	Word	0,1500	0,1500
Tremolo Echo Level	12	14	Pos Frac	0,127	0,99
Bass Fc	13	19	Word	0,1000	0,1000
Bass EQ Gain	14	21	Signed Int	-48,24	-48,24
Treble Fc	15	22	Pos Int	1,16	1,16
Treble EQ Gain	16	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	17	18	Signed Int	-24,0	-24,0
Mod1 Source	18	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	19	25	Pos Int	0,127	0,99
Mod1 Param Range Min	20	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	21	27	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
Mod2 Source	22	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	23	29	Pos Int	0,127	0,99
Mod2 Param Range Min	24	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	25	31	Pos Frac	0,127	0,99

00 — Phaser-DDL

Algorithm index code 24 : 10 unique pdefs : 20 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Phaser LFO Rate	03	01	Pos Int	0,99	0,99
Phaser LFO Width	04	02	Pos Frac	0,127	0,99
Phaser Center	05	04	Signed Frac	-128,127	-99,99
Phaser Feedback	06	05	Signed Frac	-127,127	-98,99
Phaser Notch Depth	07	06	Signed Frac	-128,127	-99,99
Left/Right LFO	08	03	Table	0,1	Field size: 13
Phaser Sample & Hold Rate	09	17	Pos Int 2	0,100	0,100
Phaser Left Delay Time	10	07	Word	0,1600	0,1600
Phaser Right Delay Time	11	09	Word	0,1600	0,1600
Phaser Delay Feedback	12	11	Signed Frac	-128,127	-99,99
Mod1 Source	13	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	14	25	Pos Int	0,127	0,99
Mod1 Param Range Min	15	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	16	27	Pos Frac	0,127	0,99
Mod2 Source	17	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	18	29	Pos Int	0,127	0,99
Mod2 Param Range Min	19	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	20	31	Pos Frac	0,127	0,99

00 — 8 Voice Chorus

Algorithm index code 21 : 07 unique pdefs : 17 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
8V Chorus LFO Rate	03	01	Pos Int	0,99	0,99
8V Chorus LFO Width	04	02	Pos Frac	0,127	0,99
8V Chorus Stereo Spread	05	03	Pos Frac	0,127	0,99
8V Chorus Regen	06	09	Pos Frac	0,127	0,99
8V Chorus Left Regen Time	07	05	Word	0,800	0,800
8V Chorus Right Regen Time	08	07	Word	0,800	0,800
8V Chorus Delay Regen	09	04	Pos Frac	0,127	0,99
Mod1 Source	10	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	11	25	Pos Int	0,127	0,99
Mod1 Param Range Min	12	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	13	27	Pos Frac	0,127	0,99
Mod2 Source	14	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	15	29	Pos Int	0,127	0,99
Mod2 Param Range Min	16	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	17	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Flanger					
Algorithm index code 23 : 04 unique pdefs : 14 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Flanger LFO Rate	03	01	Pos Int	0,99	0,99
Flanger LFO Width	04	02	Pos Int	0,99	0,99
Flanger Center	05	03	Pos Int	0,99	0,99
Flanger Regen	06	04	Signed Frac	-127,127	-98,99
Mod1 Source	07	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	08	25	Pos Int	0,127	0,99
Mod1 Param Range Min	09	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	10	27	Pos Frac	0,127	0,99
Mod2 Source	11	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	12	29	Pos Int	0,127	0,99
Mod2 Param Range Min	13	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	14	31	Pos Frac	0,127	0,99
00 — Pitch Shifter					
Algorithm index code 26 : 11 unique pdefs : 21 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
PitchShifter Vc 1 Semi	03	01	Signed Int	-12,12	-12,12
PitchShifter Vc 1 Fine	04	02	Signed Frac	-127,127	-98,99
PitchShifter Vc 1 Level	05	03	Pos Frac	0,127	0,99
PitchShifter Vc 1 Pan	06	04	Signed Frac	-128,127	-99,99
PitchShifter Vc 2 Semi	07	05	Signed Int	-12,12	-12,12
PitchShifter Vc 2 Fine	08	06	Signed Frac	-127,127	-98,99
PitchShifter Vc 2 Level	09	07	Pos Frac	0,127	0,99
PitchShifter Vc 2 Pan	10	08	Signed Frac	-128,127	-99,99
Delay vs Quality	11	09	Table	0,1	Field size: 13
PitchShifter LFO Rate	12	10	Pos Int	0,99	0,99
PitchShifter LFO Width	13	11	Pos Int	0,99	0,99
Mod1 Source	14	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	15	25	Pos Int	0,127	0,99
Mod1 Param Range Min	16	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	17	27	Pos Frac	0,127	0,99
Mod2 Source	18	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	19	29	Pos Int	0,127	0,99
Mod2 Param Range Min	20	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	21	31	Pos Frac	0,127	0,99
00 — Pitch Shift 2U					
Algorithm index codes 36,37 : 10 unique pdefs : 20 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
PitchShifter Vc 1 Semi	03	01	Signed Int	-12,12	-12,12
PitchShifter Vc 1 Fine	04	02	Signed Frac	-127,127	-98,99
PitchShifter Vc 1 Level	05	03	Pos Frac	0,127	0,99
PitchShifter Vc 1 Pan	06	04	Signed Frac	-128,127	-99,99
PitchShifter Vc 2 Semi	07	05	Signed Int	-12,12	-12,12
PitchShifter Vc 2 Fine	08	06	Signed Frac	-127,127	-98,99
PitchShifter Vc 2 Level	09	07	Pos Frac	0,127	0,99
PitchShifter Vc 2 Pan	10	08	Signed Frac	-128,127	-99,99
PitchShifter LFO Rate	11	10	Pos Int	0,99	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
PitchShifter LFO Width	12	11	Pos Int	0,99	0,99
Mod1 Source	13	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	14	25	Pos Int	0,127	0,99
Mod1 Param Range Min	15	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	16	27	Pos Frac	0,127	0,99
Mod2 Source	17	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	18	29	Pos Int	0,127	0,99
Mod2 Param Range Min	19	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	20	31	Pos Frac	0,127	0,99

00 — PitchShift-DDL

Algorithm index code 25 : 13 unique pdefs : 23 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
PitchShift Vc 1 Semi	03	01	Signed Int	-12,12	-12,12
PitchShift Vc 1 Fine	04	02	Signed Frac	-127,127	-98,99
PitchShift Vc 1 Level	05	03	Pos Frac	0,127	0,99
PitchShifter Vc 1 Pan	06	04	Signed Frac	-128,127	-99,99
PitchShift Vc 2 Semi	07	05	Signed Int	-12,12	-12,12
PitchShift Vc 2 Fine	08	06	Signed Frac	-127,127	-98,99
PitchShift Vc 2 Level	09	07	Pos Frac	0,127	0,99
PitchShifter Vc 2 Pan	10	08	Signed Frac	-128,127	-99,99
PitchShift Dry Level to DDL	11	09	Pos Frac	0,127	0,99
PitchShift Left Delay Time	12	10	Word	0,1500	0,1500
PitchShift Right Delay Time	13	12	Word	0,1500	0,1500
PitchShift Delay Mix	14	14	Pos Frac	0,127	0,99
PitchShift Delay Regen	15	15	Signed Int	-99,99	-99,99
Mod1 Source	16	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	17	25	Pos Int	0,127	0,99
Mod1 Param Range Min	18	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	19	27	Pos Frac	0,127	0,99
Mod2 Source	20	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	21	29	Pos Int	0,127	0,99
Mod2 Param Range Min	22	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	23	31	Pos Frac	0,127	0,99

00 — FastPitchShift

Algorithm index code 48 : 08 unique pdefs : 18 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
PitchShifter Vc 1 Fine	03	02	Signed Frac	-127,127	-98,99
PitchShifter Vc 1 Level	04	03	Pos Frac	0,127	0,99
PitchShifter Vc 1 Pan	05	04	Signed Frac	-128,127	-99,99
PitchShifter Vc 2 Fine	06	06	Signed Frac	-127,127	-98,99
PitchShifter Vc 2 Level	07	07	Pos Frac	0,127	0,99
PitchShifter Vc 2 Pan	08	08	Signed Frac	-128,127	-99,99
PitchShifter LFO Rate	09	10	Pos Int	0,99	0,99
PitchShifter LFO Width	10	11	Pos Int	0,99	0,99
Mod1 Source	11	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	12	25	Pos Int	0,127	0,99
Mod1 Param Range Min	13	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	14	27	Pos Frac	0,127	0,99
Mod2 Source	15	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	16	29	Pos Int	0,127	0,99
Mod2 Param Range Min	17	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	18	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — EQ-Compressor					
Algorithm index code 17 : 14 unique pdefs : 24 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Compressor Gain	03	01	Signed Int	-48,48	-48,48
Compressor Ratio	04	02	Table	0,34	Field size: 3
Compressor Threshold	05	03	Signed Int	-96,0	-96,0
GainChange	06	–	Function	(Gain Meter : non-editable parameter	
Comp Attack	07	04	Table	0,28	Field size: 5
Comp Release	08	05	Table	0,53	Field size: 5
Comp Noise Gate Off Below	09	06	Signed Int	-96,0	-96,0
Comp Noise Gate On Above	10	07	Signed Int	-96,0	-96,0
Gate Release Time	11	08	Table	0,53	Field size: 5
Bass Fc	12	19	Word	0,1000	0,1000
Bass EQ Gain	13	21	Signed Int	-48,24	-48,24
Treble Fc	14	22	Pos Int	1,16	1,16
Treble EQ Gain	15	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	16	18	Signed Int	-24,0	-24,0
Mod1 Source	17	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	18	25	Pos Int	0,127	0,99
Mod1 Param Range Min	19	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	20	27	Pos Frac	0,127	0,99
Mod2 Source	21	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	22	29	Pos Int	0,127	0,99
Mod2 Param Range Min	23	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	24	31	Pos Frac	0,127	0,99
00 — Expander					
Algorithm index code 19 : 13 unique pdefs : 23 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Exp Ratio	03	07	Table	0,34	Field size: 3
Threshold	04	03	Signed Int	-96,0	-96,0
Gain Change	05	–	Function	(Gain Meter : non-editable parameter	
Exp Attack	06	04	Table	0,28	Field size: 5
Exp Release	07	05	Table	0,53	Field size: 5
Exp Gate Hold Time	08	06	Table	0,62	Field size: 5
Sidechain EQ Gain	09	08	Signed Int	-48,48	-48,48
HighPass Fc	10	01	Table	0,43	Field size: 4
LowPass Fc	11	02	Table	0,29	Field size: 4
Trigger Mask	12	09	Table	0,1	Field size: 3
TriggeTime	13	10	Table	0,62	Field size: 5
Trig Mask Lower Threshold	14	11	Signed Int	-96,0	-96,0
Expander Output Gain	15	13	Signed Int	-48,48	-48,48
Mod1 Source	16	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	17	25	Pos Int	0,127	0,99
Mod1 Param Range Min	18	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	19	27	Pos Frac	0,127	0,99
Mod2 Source	20	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	21	29	Pos Int	0,127	0,99
Mod2 Param Range Min	22	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	23	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Keyed Expander					
Algorithm index code 58 : 14 unique pdefs : 24 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Exp Ratio	03	07	Table	0,34	Field size: 3
Threshold	04	03	Signed Int	-96,0	-96,0
Gain Change	05	–	Function	(Gain Meter : non-editable parameter	
Exp Attack	06	04	Table	0,28	Field size: 5
Exp Release	07	05	Table	0,53	Field size: 5
Exp Gate Hold Time	08	06	Table	0,62	Field size: 5
Sidechain EQ Gain	09	08	Signed Int	-48,48	-48,48
HighPass Fc	10	01	Table	0,43	Field size: 4
LowPass Fc	11	02	Table	0,29	Field size: 4
Trigger Mask	12	09	Table	0,1	Field size: 3
TriggeTime	13	10	Table	0,62	Field size: 5
Trigger Mask Threshold	14	11	Signed Int	-96,0	-96,0
Expander Output Mix	15	12	Pos Frac	0,127	0,99
Expander Output Gain	16	13	Signed Int	-48,48	-48,48
Mod1 Source	17	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	18	25	Pos Int	0,127	0,99
Mod1 Param Range Min	19	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	20	27	Pos Frac	0,127	0,99
Mod2 Source	21	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	22	29	Pos Int	0,127	0,99
Mod2 Param Range Min	23	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	24	31	Pos Frac	0,127	0,99
00 — InversExpander					
Algorithm index code 20 : 12 unique pdefs : 22 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Expnd Ratio	03	02	Table	0,34	Field size: 3
Threshold	04	03	Signed Int	-96,0	-96,0
Gain Change	05	–	Function	(Gain Meter : non-editable parameter	
Exp Attack	06	04	Table	0,28	Field size: 5
Exp Release	07	05	Table	0,53	Field size: 5
Exp Noise Gate Off Below	08	06	Signed Int	-96,0	-96,0
Comp Noise Gate On Above	09	07	Signed Int	-96,0	-96,0
Bass Fc	10	19	Word	0,1000	0,1000
Bass EQ Gain	11	21	Signed Int	-48,24	-48,24
Treble Fc	12	22	Pos Int	1,16	1,16
Treble EQ Gain	13	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	14	18	Signed Int	-24,0	-24,0
Mod1 Source	15	24	Table	0,8	Off,Controller 1..8
Mod1 Destination	16	25	Pos Int	0,127	0,99
Mod1 Param Range Min	17	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	18	27	Pos Frac	0,127	0,99
Mod2 Source	19	28	Table	0,8	Off,Controller 1..8
Mod2 Destination	20	25	Pos Int	0,127	0,99
Mod2 Param Range Min	21	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	22	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — De-esser					
Algorithm index code 41 : 20 unique pdefs : 30 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
De-esser Output Gain	03	15	Signed Int	-48,48	-48,48
Comp Ratio	04	16	Table	0,34	Field size: 3
Threshold	05	17	Signed Int	-96,0	-96,0
Gain Change	06	–	Function	(Gain Meter : non-editable parameter	
Comp Attack	07	18	Table	0,28	Field size: 5
Comp Release	08	19	Table	0,53	Field size: 5
Noise Gate Off Below	09	20	Signed Int	-96,0	-96,0
Noise Gate On Above	10	21	Signed Int	-96,0	-96,0
Sidechain EQ HighPass Fc	11	23	Table	0,43	Field size: 4
Bass Fc	12	01	Word	0,1000	0,1000
Bass Gain (loShv)	13	03	Signed Int	-48,24	-48,24
Mid1 Fc	14	04	Word 2	100,9999	100,9999
Mid1 Gain	15	06	Signed Int	-48,24	-48,24
Mid1 Q	16	07	Pos Int	1,18	1,18
Mid2 Fc	17	08	Word 2	100,9999	100,9999
Mid2 Gain	18	10	Signed Int	-48,24	-48,24
Mid2 Q	19	11	Pos Int	1,18	1,18
Treble Fc	20	12	Pos Int	1,16	1,16
Treble Gain (HiShv)	21	13	Signed Int	-48,24	-48,24
Sidechain EQ Input Trim	22	14	Signed Int	-48,0	-48,0
Mod1 Source	23	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	24	25	Pos Int	0,127	0,99
Mod1 Param Range Min	25	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	26	27	Pos Frac	0,127	0,99
Mod2 Source	27	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	28	29	Pos Int	0,127	0,99
Mod2 Param Range Min	29	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	30	31	Pos Frac	0,127	0,99
00 — Ducker / Gate					
Algorithm index code 42 : 20 unique pdefs : 30 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Ducker Output Gain	03	15	Signed Int	-48,48	-48,48
Ducker Output Mix	04	22	Pos Frac	0,127	0,99
Comp Ratio	05	16	Table	0,34	Field size: 3
Threshold	06	17	Signed Int	-96,0	-96,0
Gain Change	07	–	Function	(Gain Meter : non-editable parameter	
Comp Attack	08	18	Table	0,28	Field size: 5
Comp Release	09	19	Table	0,53	Field size: 5
Noise Gate Off Below	10	20	Signed Int	-96,0	-96,0
Noise Gate On Above	11	21	Signed Int	-96,0	-96,0
Bass Fc	12	01	Word	0,1000	0,1000
Bass Gain (loShv)	13	03	Signed Int	-48,24	-48,24
Mid1 Fc	14	04	Word 2	100,9999	100,9999
Mid1 Gain	15	06	Signed Int	-48,24	-48,24
Mid1 Q	16	07	Pos Int	1,18	1,18
Mid2 Fc	17	08	Word 2	100,9999	100,9999
Mid2 Gain	18	10	Signed Int	-48,24	-48,24
Mid2 Q	19	11	Pos Int	1,18	1,18

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
Treble Fc	20	12	Pos Int	1,16	1,16
Treble Gain (HiShv)	21	13	Signed Int	-48,24	-48,24
Side Chain EQ Input Trim	22	14	Signed Int	-48,0	-48,0
Mod1 Source	23	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	24	25	Pos Int	0,127	0,99
Mod1 Param Range Min	25	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	26	27	Pos Frac	0,127	0,99
Mod2 Source	27	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	28	29	Pos Int	0,127	0,99
Mod2 Param Range Min	29	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	30	31	Pos Frac	0,127	0,99

00 — Rumble Filter

Algorithm index code 55 : 03 unique pdefs : 13 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
HighPass Fc	03	01	Table	0,43	Field size: 4
LowPass Fc	04	02	Table	0,29	Field size: 4
Filter Gain	05	03	Signed Int	-48,48	-48,48
Mod1 Source	06	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	07	25	Pos Int	0,127	0,99
Mod1 Param Range Min	08	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	09	27	Pos Frac	0,127	0,99
Mod2 Source	10	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	11	29	Pos Int	0,127	0,99
Mod2 Param Range Min	12	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	13	31	Pos Frac	0,127	0,99

00 — Parametric EQ

Algorithm index code 12 : 11 unique pdefs : 21 total params

Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Bass Fc	03	01	Word	0,1000	0,1000
Bass Gain (loShv)	04	03	Signed Int	-48,24	-48,24
Mid1 Fc	05	04	Word 2	100,9999	100,9999
Mid1 Gain	06	06	Signed Int	-48,24	-48,24
Mid1 Q	07	07	Pos Int	1,18	1,18
Mid2 Fc	08	08	Word 2	100,9999	100,9999
Mid2 Gain	09	10	Signed Int	-48,24	-48,24
Mid2 Q	10	11	Pos Int	1,18	1,18
Treble Fc	11	12	Pos Int	1,16	1,16
Treble Gain (HiShv)	12	13	Signed Int	-48,24	-48,24
EQ Input Level Attenuation	13	14	Signed Int	-24,0	-24,0
Mod1 Source	14	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	15	25	Pos Int	0,127	0,99
Mod1 Param Range Min	16	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	17	27	Pos Frac	0,127	0,99
Mod2 Source	18	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	19	29	Pos Int	0,127	0,99
Mod2 Param Range Min	20	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	21	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — VanderPolFilter					
Algorithm index code 28 : 03 unique pdefs : 13 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
VanderPol Filter HighPass Fc	03	01	Table	0,43	Field size: 4
VanderPol Filter LowPass Fc	04	02	Table	0,29	Field size: 4
Filter Gain	05	03	Signed Int	-48,48	-48,48
Mod1 Source	06	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	07	25	Pos Int	0,127	0,99
Mod1 Param Range Min	08	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	09	27	Pos Frac	0,127	0,99
Mod2 Source	10	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	11	29	Pos Int	0,127	0,99
Mod2 Param Range Min	12	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	13	31	Pos Frac	0,127	0,99
00 — Sine/Noise Gen					
Algorithm index code 29 : 08 unique pdefs : 18 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Sine/Noise Gen Sine Freq	03	01	Word	0,9999	0,9999
Sine/Noise Gen Balance	04	03	Pos Frac	0,127	0,99
Noise Filters - Low Pass Fc	05	04	Table	0,29	Field size: 4
Bass Fc	06	19	Word	0,1000	0,1000
EQ Gain	07	21	Signed Int	-48,48	-48,48
Treble Fc	08	22	Pos Int	1,16	1,16
EQ Gain	09	23	Signed Int	-48,24	-48,24
EQ Input Level Trim	10	18	Signed Int	-24,0	-24,0
Mod1 Source	11	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	12	25	Pos Int	0,127	0,99
Mod1 Param Range Min	13	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	14	27	Pos Frac	0,127	0,99
Mod2 Source	15	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	16	29	Pos Int	0,127	0,99
Mod2 Param Range Min	17	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	18	31	Pos Frac	0,127	0,99

Name	*Number*	*Offset*	*Type*	*Internal*	*Displayed*
00 — Vocoder Low, Vocoder Mid 1, Vocoder Mid 2, Vocoder High					
Algorithm index codes 32,33,34,35 : 04 unique pdefs : 14 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Vocoder Speech Gain	03	01	Signed Int	-48,48	-48,48
Vocoder Sibilance Lev	04	02	Pos Frac	0,127	0,99
Vocoder Response Time	05	03	Table	0,2	Field size: 4
Vocoder Pre-emphasis	06	04	Pos Frac	0,127	0,99
Mod1 Source	07	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	08	25	Pos Int	0,127	0,99
Mod1 Param Range Min	09	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	10	27	Pos Frac	0,127	0,99
Mod2 Source	11	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	12	29	Pos Int	0,127	0,99
Mod2 Param Range Min	13	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	14	31	Pos Frac	0,127	0,99
00 — No Effect					
Algorithm index code 00 : 00 unique pdefs : 10 total params					
Mix	01	33	Pos Int	0,127	0,99
Volume	02	32	Pos Int	0,127	0,99
Mod1 Source	03	24	Table	0,8	Off,Controller 1..8
Mod1 Destination Parameter	04	25	Pos Int	0,127	0,99
Mod1 Param Range Min	05	26	Pos Frac	0,127	0,99
Mod1 Param Range Max	06	27	Pos Frac	0,127	0,99
Mod2 Source	07	28	Table	0,8	Off,Controller 1..8
Mod2 Destination Parameter	08	29	Pos Int	0,127	0,99
Mod2 Param Range Min	10	30	Pos Frac	0,127	0,99
Mod2 Param Range Max	10	31	Pos Frac	0,127	0,99